

CLAIMS

We claim:

5           1. An isolated polynucleotide comprising a nucleic acid sequence shown in  
any one of Figures 1B, 1C, 1D, 2B, 3B, 4B, 5B, 6B, 7B, 8B, and 9B.

10           2. An isolated polynucleotide comprising a nucleic acid sequence selected  
from the group consisting of:

- (a) a nucleic acid sequence of at least 90 nucleotides that is essentially  
identical to a linear nucleotide sequence of comparable length depicted  
in Figure 1D;
- (b) a nucleic acid sequence of at least 90 nucleotides encoding a  
polypeptide that is essentially identical to a linear peptide sequence of  
at least 30 amino acids depicted in Figure 1A; and
- (c) a complement of (a) or (b).

15           3. An isolated polynucleotide comprising a nucleic acid sequence selected  
from the group consisting of:

- 20           (a) a nucleic acid sequence of at least 90 nucleotides that is essentially  
identical to a linear nucleotide sequence of comparable length  
depicted in Figure 2B;
- (b) a nucleic acid sequence of at least 90 nucleotides encoding a  
polypeptide that is essentially identical to a linear peptide sequence of  
at least 30 amino acids depicted in Figure 2A; and
- 25           (c) a complement of (a) or (b).

4. An isolated polynucleotide comprising a nucleic acid sequence selected  
from the group consisting of:

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- (a) a nucleic acid sequence of at least 90 nucleotides that is essentially identical to a linear nucleotide sequence of comparable length depicted in Figure 3B;
  - (b) a nucleic acid sequence of at least 90 nucleotides encoding a polypeptide that is essentially identical to a linear peptide sequence of at least 30 amino acids depicted in Figure 3A; and
  - (c) a complement of (a) or (b).

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5. An isolated polynucleotide comprising a nucleic acid sequence selected from the group consisting of:

- (a) a nucleic acid sequence of at least 90 nucleotides that is essentially identical to a linear nucleotide sequence of comparable length depicted in Figure 4B;
- (b) a nucleic acid sequence of at least 90 nucleotides encoding a polypeptide that is essentially identical to a linear peptide sequence of at least 30 amino acids depicted in Figure 4A; and
- (c) a complement of (a) or (b).

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6. An isolated polynucleotide comprising a nucleic acid sequence selected from the group consisting of:

- (a) a nucleic acid sequence of at least 90 nucleotides that is essentially identical to a linear nucleotide sequence of comparable length depicted in Figure 5B;
- (b) a nucleic acid sequence of at least 90 nucleotides encoding a polypeptide that is essentially identical to a linear peptide sequence of at least 30 amino acids depicted in Figure 5A; and
- (c) a complement of (a) or (b).

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7. An isolated polynucleotide comprising a nucleic acid sequence selected from the group consisting of:

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- (a) a nucleic acid sequence of at least 90 nucleotides that is essentially identical to a linear nucleotide sequence of comparable length depicted in Figure 6B;
  - (b) a nucleic acid sequence of at least 90 nucleotides encoding a polypeptide that is essentially identical to a linear peptide sequence of at least 30 amino acids depicted in Figure 6A; and
  - (c) a complement of (a) or (b).

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8. An isolated polynucleotide comprising a nucleic acid sequence selected from the group consisting of:

- (a) a nucleic acid sequence of at least 90 nucleotides that is essentially identical to a linear nucleotide sequence of comparable length depicted in Figure 7B;
- (b) a nucleic acid sequence of at least 90 nucleotides encoding a polypeptide that is essentially identical to a linear peptide sequence of at least 30 amino acids depicted in Figure 7A; and
- (c) a complement of (a) or (b).

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9. An isolated polynucleotide comprising a nucleic acid sequence selected from the group consisting of:

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- (a) a nucleic acid sequence of at least 90 nucleotides that is essentially identical to a linear nucleotide sequence of comparable length depicted in Figure 8B;
  - (b) a nucleic acid sequence of at least 90 nucleotides encoding a polypeptide that is essentially identical to a linear peptide sequence of at least 30 amino acids depicted in Figure 8A; and
  - (c) a complement of (a) or (b).

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10. An isolated polynucleotide comprising a nucleic acid sequence selected from the group consisting of:

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- (a) a nucleic acid sequence of at least 90 nucleotides that is essentially identical to a linear nucleotide sequence of comparable length depicted in Figure 9B;
  - (b) a nucleic acid sequence of at least 90 nucleotides encoding a polypeptide that is essentially identical to a linear peptide sequence of at least 30 amino acids depicted in Figure 9A; and
  - (c) a complement of (a) or (b).

11. The isolated polynucleotide of claim 2, 3, 4, 5, 6, 7, 8, or 9, wherein said nucleic acid is (a).

12. The isolated polynucleotide of claim 2, 3, 4, 5, 6, 7, 8, or 9, wherein said nucleic acid is (b).

13. The isolated polynucleotide of claim 2, 3, 4, 5, 6, 7, 8, or 9, wherein said nucleic acid is (c).

14. The isolated polynucleotide of claim 2, 3, 4, 5, 6, 7, 8, or 9, wherein said nucleic acid encodes a polypeptide comprising an amino acid sequence that is essentially identical to a linear sequence of comparable length shown in any one of Figures 1A, 2A, 3A, 4A, 5A, 6A, 7A, 8A, and 9A.

15. The isolated polynucleotide of claim 2, 3, 4, 5, 6, 7, 8, or 9, wherein said nucleic acid sequence encodes a polypeptide comprising the amino acid sequence shown in any one of Figures 1A, 2A, 3A, 4A, 5A, 6A, 7A, 8A, and 9A.

16. The isolated polynucleotide of claim 2, 3, 4, 5, 6, 7, 8, or 9, wherein said nucleic acid encodes a polypeptide comprising an amino acid sequence

essentially identical to the entire amino acid sequence shown in any one of Figures 1A, 2A, 3A, 4A, 5A, 6A, 7A, 8A, and 9A.

17. The isolated polynucleotide of claim 2, 3, 4, 5, 6, 7, 8, or 9, wherein said nucleic acid is identical to a linear nucleotide sequence of comparable length contained in the sequence shown in any one of Figures 1B, 1C, 1D, 2B, 3B, 4B, 5B, 6B, 7B, 8B, and 9B.

18. The isolated polynucleotide of claim 2, 3, 4, 5, 6, 7, 8, or 9, which is DNA.

19. The isolated polynucleotide of claim 2, 3, 4, 5, 6, 7, 8, or 9, which is RNA.

20. The isolated polynucleotide of claim 18, wherein the DNA is a full-length cDNA molecule.

21. The isolated polynucleotide of claim 2, 3, 4, 5, 6, 7, 8, or 9, further comprising a heterologous polynucleotide.

22. The isolated polynucleotide of claim 21, wherein the heterologous polynucleotide encodes a heterologous polypeptide.

23. An isolated polynucleotide comprising a nucleic acid sequence selected from the group consisting of:

(a) a nucleic acid sequence encoding the first transmembrane region of any one of the gene sequences designated GW.S.ctg16335-000003.31.0, GW.S.ctg16490-000000.17.0, GW.S.ctg13100-000000.33.0, GW.A.ctg12444-000001.0.2, GW.S.ctg12789-000004.100.0, GW.A.ctg12776-000000.33.0, GW.S.ctg12776-000000.175.0, GW.S.ctg16790-000000.13.0, and GW.S.ctg12776-000000.172.0;

- (b) a nucleic acid sequence encoding the second transmembrane region of any one of the gene sequences designated GW.S.ctg16335-000003.31.0, GW.S.ctg16490-000000.17.0, GW.S.ctg13100-000000.33.0, GW.A.ctg12444-000001.0.2, GW.S.ctg12789-000004.100.0, GW.A.ctg12776-000000.33.0, GW.S.ctg12776-000000.175.0, GW.S.ctg16790-000000.13.0, and GW.S.ctg12776-000000.172.0;
  - (c) a nucleic acid sequence encoding the third transmembrane region of any one of the gene sequences designated GW.S.ctg16335-000003.31.0, GW.S.ctg16490-000000.17.0, GW.S.ctg13100-000000.33.0, GW.A.ctg12444-000001.0.2, GW.S.ctg12789-000004.100.0, GW.A.ctg12776-000000.33.0, GW.S.ctg12776-000000.175.0, GW.S.ctg16790-000000.13.0, and GW.S.ctg12776-000000.172.0;
  - (d) a nucleic acid sequence encoding the fourth transmembrane region of any one of the gene sequences designated GW.S.ctg16335-000003.31.0, GW.S.ctg16490-000000.17.0, GW.S.ctg13100-000000.33.0, GW.A.ctg12444-000001.0.2, GW.S.ctg12789-000004.100.0, GW.A.ctg12776-000000.33.0, GW.S.ctg12776-000000.175.0, GW.S.ctg16790-000000.13.0, and GW.S.ctg12776-000000.172.0;
  - (e) a nucleic acid sequence encoding the fifth transmembrane region of any one of the gene sequences designated GW.S.ctg16335-000003.31.0, GW.S.ctg16490-000000.17.0, GW.S.ctg13100-000000.33.0, GW.A.ctg12444-000001.0.2, GW.S.ctg12789-000004.100.0, GW.A.ctg12776-000000.33.0, GW.S.ctg12776-000000.175.0, GW.S.ctg16790-000000.13.0, and GW.S.ctg12776-000000.172.0;
  - (f) a nucleic acid sequence encoding the sixth transmembrane region of any one of the gene sequences designated GW.S.ctg16335-000003.31.0, GW.S.ctg16490-000000.17.0, GW.S.ctg13100-000000.33.0, GW.A.ctg12444-000001.0.2, GW.S.ctg12789-000004.100.0, GW.A.ctg12776-000000.33.0, GW.S.ctg12776-000000.175.0, GW.S.ctg16790-000000.13.0, and GW.S.ctg12776-000000.172.0;
  - (g) a nucleic acid sequence encoding the seventh transmembrane region of any one of the gene sequences designated GW.S.ctg16335-000003.31.0, GW.S.ctg16490-000000.17.0, GW.S.ctg13100-000000.33.0, GW.A.ctg12444-000001.0.2, GW.S.ctg12789-000004.100.0, GW.A.ctg12776-000000.33.0, GW.S.ctg12776-000000.175.0, GW.S.ctg16790-000000.13.0, and GW.S.ctg12776-000000.172.0;
  - (h) a nucleic acid sequence encoding all seven transmembrane regions of any one of the gene sequences designated GW.S.ctg16335-000003.31.0, GW.S.ctg16490-000000.17.0, GW.S.ctg13100-000000.33.0, GW.A.ctg12444-000001.0.2, GW.S.ctg12789-000004.100.0, GW.A.ctg12776-000000.33.0, GW.S.ctg12776-000000.175.0, GW.S.ctg16790-000000.13.0, and GW.S.ctg12776-000000.172.0; and
  - (i) a complement of anyone of (a) through (h).

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24. The isolated polynucleotide of claim 23, further comprises a heterologous polynucleotide.

25. A pharmaceutical composition comprising the polynucleotide of claim 1.

26. The isolated polynucleotide of claim 1, wherein said polynucleotide is conjugated with a detectable label selected from the group consisting of enzymes, radioactive moieties and luminescent moieties.

27. A gene delivery vehicle, comprising an isolated polynucleotide of claim 1.

28. The gene delivery vehicle of claim 27, wherein the vehicle is selected from the group consisting of viral vector, a liposome and a plasmid.

29. A genetically engineered host cell comprising an isolated polynucleotide of claim 1.

30. A recombinant method of producing a polypeptide that comprises culturing the genetically engineered host cell of claim 29 under conditions suitable for protein expression, and isolating the expressed polypeptide.

31. An isolated polypeptide encoded by the polynucleotide of claim 1.

32. A pharmaceutical composition comprising the polypeptide of claim 31.

33. An antibody that specifically binds to the isolated polypeptide of claim 31.

34. The antibody of claim 33, wherein the antibody is a monoclonal antibody.

35. A hybridoma cell line that produces the monoclonal antibody of claim 34.

36. The antibody of claim 34, wherein the monoclonal antibody is a humanized antibody.
  37. A method for identifying a modulator of a G-protein-coupled receptor (GPCR) encoded by the polynucleotide of claim 1, comprising:
    - (a) contacting a candidate GPCR modulator with said GPCR; and
    - (b) assaying for an alteration of GPCR activity and/or GPCR expression.
  38. The method of claim 37, wherein the contacting step occurs in a cell comprising said GPCR.
  39. The method of claim 38, where the GPCR activity is characterized by a stimulation of phospholipase C activity.
  40. The method of claim 38, where the GPCR activity is characterized by a stimulation or an inhibition of adenylyl cyclase activity.
  41. The method of claim 37, wherein the candidate modulator is selected from the group consisting of an antisense oligonucleotide, a ribozyme, a ribozyme derivative, an antibody, a liposome, a small molecule and an inorganic compound.
  42. A modulator identified by the method of claim 37.
  43. A method of diagnosing a pathogenic condition or susceptibility to a pathogenic condition that is associated with a genetic alteration in GPCR encoded by the polynucleotide of claim 1, comprising:
    - (a) providing a biological sample of a subject containing nucleic acid molecules and/or polypeptides;

- (b) determining a genetic alteration associated with the GPCR; and  
(c) correlating the alteration with a pathogenic condition or susceptibility to a pathogenic condition.

5           44. The method of claim 43, wherein the genetic alteration is selected from the group consisting of sequence deletion, substitution, translocation, and differential gene expression.

10           45. A computer readable medium having recorded thereon the nucleic acid sequence of claim 1.

15           46. A computer readable medium having recorded thereon the polypeptide sequence of claim 31.

20           47. The computer readable medium of claim 45 or 46, wherein said medium is selected from the group consisting of:  
(a) magnetic storage medium;  
(b) optical storage medium;  
(c) electrical storage medium; and  
(d) hybrid storage medium of (a), (b), (c) or (d).

25           48. A computer readable medium of claim 47, wherein the magnetic storage medium is selected from the group consisting of floppy discs, hard disc, and magnetic tape.

30           49. A computer readable medium of claim 47, wherein the optical storage medium is CD-ROM.

50. A computer readable medium of claim 47, wherein the electrical storage media is random access memory (RAM) or read only memory (ROM).

51. A computer readable medium of claim 47, wherein the hybrid storage  
medium is magnetic/optical storage medium.
- 5 52. A transgenic animal comprising the gene delivery vehicle of claim 27.
53. A kit comprising the isolated polynucleotide of claim 1 in suitable  
packaging.
- 10 54. A kit comprising the isolated polypeptide of claim 31 in suitable  
packaging.

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